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Different Approaches in Bathrobe Manufacturing: New Concept Pestemal Bathrobes, an Irreplaceable Element of Hammam Culture

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Abstract
In the present study, bathrobes manufactured from terry towel fabric in the scope of home textile and new trend bathrobes made from pestemal with a 650-year long history were compared in terms of their fabric utilization efficiency in the garment manufacturing process. Terry towel fabric bathrobes have a significant market share in home textile. The present study aimed to investigate and compare the fabric utilisation efficiency of pestemal bathrobes and terry towel fabric bathrobes in pattern and spread cutting processes. The effect of the properties of towel fabric and the pestemal bathrobe on the fabric cutting process in garment manufacturing was investigated. Within the scope of this study, marker plans for 3 different selected bathrobe models were prepared by taking the widths of terry towel fabric and pestemal fabrics into consideration. As a result of the investigations, ideal fabric widths of coiled fabric for kimono, shawl collar and hooded bathrobe models for the cutting process were determined as 152, 163 and 158 cm, respectively. For pestemal bathrobes, an ideal spreading plan was suggested according to the weaving method reported. In the light of these findings, relevant suggestions concerning fabric utility efficiency were drawn for manufacturers concerning garment manufacturing processes using both fabric types.

Key words: *pestemal, newly designed bathrobes, towel fabric, fabric efficiency, terry woven fabrics, fabric utilisation ratio, productivity.*

Introduction

Home textile products, as the core of the textile and garment manufacturing industry, are the ones preferred in terms of aesthetic and functional aspects. Among home textile products, towel and towel fabrics are the prominent products used for drying purposes. On the other hand, pestemals have advantages over towel fabrics, such as a shorter drying period and their light weight, as new trend products. Pestemals, a traditional product known for centuries, have been further developed and demand for these products has increased.

In the world home textile market, the largest commercial share belongs to the towel and bathrobe trade – 25%. In 2015, the share of towel and bathrobe constituted 40% of the overall home textile export of Turkey [1]. Whereas the largest exporter was China, who exported half of the total world towels and bathrobes, followed by Pakistan, India and Turkey, respectively [2]. The manufacturing of regional hand woven products in Denizli City, the most concentrated towel and bathrobe manufacturing area in Turkey, has centuries-long history. Of hand woven fabrics in the past, the most popular were the cloaks and fabrics of garments as worn by the warriors in the Troy movie, woven products of Kızılcabölük and Buldan counties. The fame of these fabrics also reached royal families and became ceremonial clothes, dresses, shirts, shawls, and the bridals of sultans' families [3-4].

Bathrobes manufactured from pestemal in Turkish bath culture have substituted for those made out of traditional towel fabrics; and the demand for pestemal bathrobes has been increasing day by day. The "*pestemal*" (pesh-te-mahl) was a large towel fringed at both ends and wrapped around the torso, from below the armpits to about mid-thigh, worn traditionally as a woman made her way to a "kurna" or marble basin. The pestemal would be striped or checked, a colored mixture of silk and cotton, or pure cotton, or even pure silk [5].

Wasiak & Snycerski's investigation concerned the influence of the type of raw material, fabric structure, as well as the water absorption ability and handle of terry woven fabrics. The aim of the study was to find out how the level of two usability features depends on the kind of raw material as well as on the woven fabric's structure and finish [7].

Considering their end uses, towels should display certain properties such as appropriate hydrophility, softness, and dimensional variation (dV), of which hydrophil-

ity is the most important quality parameter. Since towels are frequently washed for hygiene, dimensional variation after washing is also an important property [8].

In one experimental study, the relationship between towel performance (hydrophility and dimensional variation properties) and selected physical & production parameters such as pile height, aerial density, type of softener etc. was obtained. For this purpose, the degrees of hydrophility and dimensional variation after washing selected towel samples were tested according to the relevant standards, and the results obtained were analysed [9].

Pestemal is a cloth used in traditional outerwear for women in Buldan. It is worn as a skirt. The width of the pestemal is the garment's length. The cloth's wide sides are the waistline and hemline of the garment. Today the use of pestemal as traditional women's wear is decreasing. However, some old women still wear the pestemal [10].

The pestemal is also used as Turkish bath waist cloth. Both are rectangular and of plain weave, with cotton or silk threads used as the warp and weft. Some properties of pestemal are as follows: width 81.73±1.33 cm, length 130.79±1.64 cm, number of warps 62.96±0.98/5 cm, number of wefts 73.69±1.32/5 cm, weight per square meter 138.41±6.04 g/m2, and thickness 0.64±0.02 mm [11].

The most remarkable properties of traditional pestemals are that they are handwoven and their original tufts are specific to fabric manufactured in rectangular pieces. As is illustrated in ***Figure 1***, the original handmade tufts of pestemal are positioned at the hem lines and sleeve hems of bathrobes. Due to this necessity, it is not possible to maintain meters of woven fabric in a mass manufacturing form. There are wide varieties of pestemal manufactured in a rectangular shape, starting from a width of 60 cm. Pestemals can be found available in widths of 80, 90, 95, 100, 105, 110 and 120 cm and in lengths of 100, 110, 140, 150, 160, 170 and 200 cm.

Pestemal is manufactured in different varieties with or without colour using different ingredient recipes such as 100% cotton, silk, bamboo, poly-cotton, bamboo-cotton blends, linen or linen-cotton blends.

Figure 1. *Pestemal bathrobe examples.*

The patterns of woven clothes could also be in different varieties such as striped, bordered and jacquard motifs etc. Pestemals from the Buldan and Kızılcabölük territories are referred due to their patterns and colors as "Herringbone Pestemal", "*Sea Pestemal*", "*Saraylı Pestemal*", "*Hammam Pestemal (*Şekerci*)*", "*Flume Pestemal*", "*Rainbow Pestemal*", and "*Karagöbek Pestemal* (This is called "*Karagöbek*" because when the cloth is wrapped around the waist, the black or dark stripe on the fabric coincides right at the belly level.)" (***Figure 2***). They are usually manufactured in natural, blue, green, yellow, orange, dark blue, red, purple and beige colours.

On the other hand, towel fabrics are expected to display certain performance characteristics owing to their usage, namely softness, hydrophility, warp and weft tensile strengths, and colour sensitivity against sea water, sweat, washing and friction [6].

The drying properties of the fabrics are also important in order to remove absorbed liquid from the body in a short time and to provide comfort. The rate of drying, or in other words, the drying time, which determines the rate at which sweat or moisture in the fabric evaporates from it, determines the properties of the fabric, such as the moisture content, surface energy, and relative humidity of the air [12-14]. Pestemal bathrobes are very useful because of reasons such as being 100% cotton, quick drying, light weight, breathable, comfortable and healthy when evaluated in terms of the clothing comfort features mentioned.

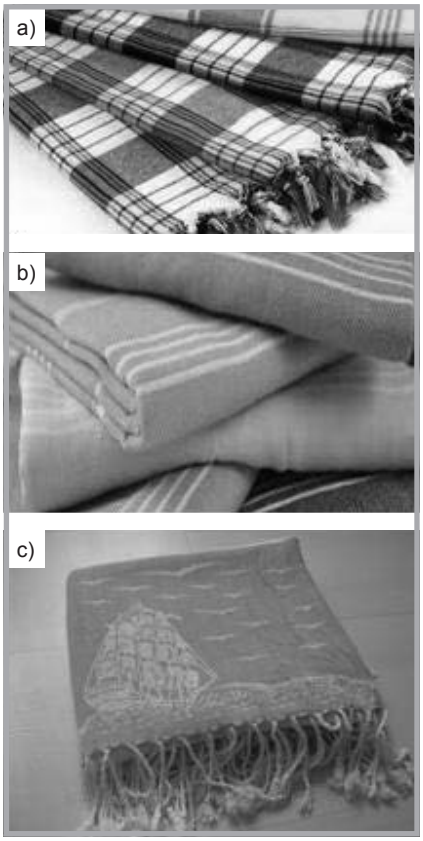

Figure 2. *Examples of a) "Şekerci Pestemal", b) "Stripped Pestemal", c) "Sea Pestemal".*

	Measures /Sizes	S	M	L
A	Length from back-middle	110	110	110
B	Closed chest	53	57	61
C	Shoulder width	12,5	13	13,5
D	Shoulder + arms' length	68	71	73
E	Arms' length	55,5	58	59,5
F	Armhole	27	28	29
G	Wristband	16,5	17,5	18,5
H	Distance from middle of shoulder to belt	44	45	46
I	Belt length/width	160/5	170/5	180/5
J	Packet width/length	20/21	20/21	20/21
K	Off skirt	65	70	75
L	Moulding width	5	5	5

Figure 3. *Kimono bathrobe model and measures.*

	Dimensions / Sizes	S	M	L
A	Back length	110	110	110
B	Closed chest	53	57	61
C	Shoulder width	12,5	13	13,5
D	Shoulder + Arms' length	68	71	73
E	Arms' length	55,5	58	59,5
F	Arm hole	27	28	29
G	Wristband	16,5	17,5	18,5
H	Distance from Shoulder to belt	44	45	46
I	Belt length/width	160/5	170/5	180/5
J	Pocket en/boy	20/21	20/21	20/21
K	Off skirt	65	70	75

Figure 4. *Shawl-collar bathrobe model and measures.*

	Measures / Sizes	S	M	L
A	Back length	110	110	110
B	Closed chest	53	57	61
C	Shoulder width	12,5	13	13,5
D	Shoulder + Arms' length	68	71	73
E	Arms' length	55,5	58	59,5
F	Arm hole	27	28	29
G	Wristband	16,5	17,5	18,5
H	Distance from shoulder to belt	44	45	46
I	Belt length/width	160/5	170/5	180/5
J	Pocket width/length	20/21	20/21	20/21
K	Off skirt	65	70	75
L	Moulding width	5	5	73
M	Pocket length from shoulder	57	57	57
N	Hood length	32,5	33	33,5
O	Hood width	29,5	30	30,5

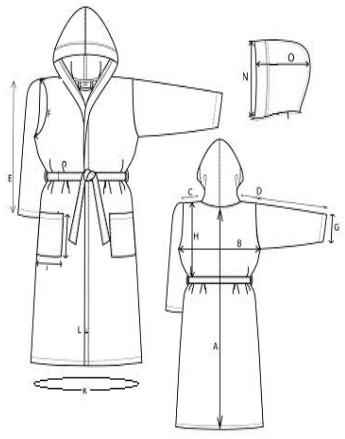

Figure 5. *Hooded bathrobe model and measures.*

In the present study, it was aimed to determine the optimum fabric width for the manufacturing process of modern bathrobes made from traditional pestemal. To that end, the fabric utilisation efficiency rates of pestemals manufactured in the market in standard widths were investigated for the three most commonly traded bathrobe models; and it was attempted to estimate the optimum pestemal size for minimum fabric wastage. The material of the present study comprised 3 distinct bathrobe models manufactured from regional hand wowen pestemals in Buldan and Kızılcabölük counties of Denizli City, Turkey and bathrobes of the same model but made out of terry towel fabrics, selected in order to compare fabric utilisation efficiency of pestemal, in which a computer-aided pattern preparation system (KonsanCAD, Turkey) employed in model-pattern departments of garment manufacturing companies and the relevant manufacturing companies was used.

Models

Within the scope of the present study, three different bathrobe models in most demand, whose technical drawings and dimensions (for S, M and L sizes) are exhibited in ***Figures 3-5***, were evaluated.

Method

The research was conducted in two stages and respective results evaluated.

Widths of terry towel fabric and pestemal

The most appropriate fabric widths were investigated for the same model and size characteristics of bathrobes manufactured from terry towel fabric and pestemal in order to determine their individual efficiencies in the fabric spreading and cutting processes. The widths of terry towel fabric and pestemal were compared. To that end, first the widths of hand woven and machine-made pestemals manufactured in Buldan and Kızılcabölük Counties, Turkey were established by arrange ing interviews with pestemal manufacturers. In order to determine the widths of terry towel fabrics, manufacturers from Denizli weaving industry, Turkey were interviewed. At the stage of determining appropriate fabric width, necessary sizes for terry towel fabric bathrobes were planned in S, M and L as 1-1-1 assortment amounts for cutting plans. In terms of manufacturing pestemal bathrobes, the cutting process was planned for each model for a single size without an assortment in the case of usage of pestemales in original dimensions (on the basis of the fact that one classic bathrobe is made out of 2 pestemales).

Alternative pattern-marker production of pestemal fabrics

An alternative pattern layout plan on spread fabric for pestemal bathrobes and the respective efficiency were investigated in order to overcome difficulty caused by the position of original tufts on the hemline and sleeve hem.

Results and discussion

Widths of terry towel fabric and pestemal

On the basis of information gathered through interviews conducted with the

companies, the widths of terry towel fabrics woven for bathrobe manufacturing varies in the range of 150 cm and 170 cm. On the other hand, the standard dimensions of pestemals used in bathrobe manufacturing are in a wide variety, ranging between 80 cm and 170 cm. In the phase of investigating the most optimal fabric widths for effective usage of fabrics, various widths were examined by means of the CAD systems employed in garment manufacturing.

In the process using the CAD system, the following steps were included:

- 1st Stage: Designing model patterns in a computer environment.
- 2nd Stage: Organising models in series.
- 3rd Stage: Preparation of cutting plans (pattern layout on fabric spread) by taking assortment amounts accepted for each terry towel fabric bathrobe model into consideration. In the manufacturing process of the pestemal bathrobe, in the case of pestemals of originally rectangular shape (in fact a classic bathrobe is manufactured from 2 pieces of pestemals), spread cutting plans are prepared for each model according to the relevant sizes without an assortment.
- 4th Stage: Determining efficiency (%) and unit fabric dimensions (cm) for the cutting process of a fabric spread for both pestemal and terry towel fabric by considering different fabric widths.

Efficiency in terry towel fabric bathrobe

As a result of these studies, efficiency findings relevant to the cutting fabric spread process for terry towel fabric bathrobes are exhibited in ***Table 1***. Accordingly the most efficient fabric width for the kimono bathrobe model was 152 cm based on the dimensions given in ***Figures 3-5***. The most efficient fabric widths were determined for shawl-collar and hooded bathrobe models – 163 cm and 158 cm, respectively. According to the unit quantities displayed in ***Table 1***, the unit dimension for the kimono bathrobe was 231 cm when the width of the fabric was 150 cm, which decreased to 200 cm when the fabric width was increased to 170 cm; accordingly the associated efficiency of the cutting fabric spread process increased from 86.40% to 87.60%. Using fabrics of 150 cm and 170 cm width on the same type of towel weaving loom is not possible. According to ***Table 1***, when the highest (88.60%) and lowest (86.40%) efficiency rates were considered, the difference between unit quantities was estimated at 8 cm. That is, an 8 cm saving for a bathrobe during the cutting stage would provide 80 meters of saving when 1,000 pieces of bathrobes are manufactured. ***Figure 6*** exhibits the efficiencies of kimono, shawl collar and hooded bathrobe models made out of terry towel fabric with respect to fabric widths in the graph.

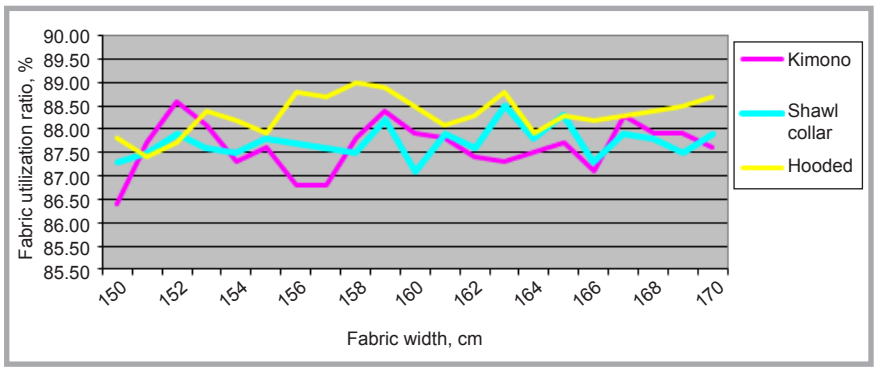

Figure 6. *Efficiency of terry towel fabric bathrobes for marker plans*

Efficiency of pestemal bathrobe

Table 2 exhibits efficiency results of examinations conducted on pestemal bathrobes whose pattern cutting plans were made according to ***Figures 3-5***. Due to the obligatory position of original tufts on sleeve hems and hemlines, 2 pieces of original pestemals were included in the pattern cutting plan prepared end-to-end in CAD design for the placement of parts of the pattern of a bathrobe in a single size. Hence this method did not allow an assortment of bathrobe sizes; thus they were laid out one by one. For instance, 2 pieces of pestemals of 80 x 160 cm dimensions were considered as the pattern length, and thus the dimension was determined as 320 cm. The efficiency percentage in the pattern cutting process was estimated at 85% for a S size bathrobe. M and L sizes were not able to be laid out in this plan. The empty boxes in ***Table 2*** suggest that no layout was possible even with a single size in a given pestemal dimension.

Table 1. *Fabric efficiency of terry towel fabric bathrobe during marker making process, and unit quantities.* ***Note:*** *Unit Fabric Utilization (cm) = Length of marker/Efficiency of marker x number of assortment size.*

Fabric witdh, cm	Kimono bathrobe		Shawl collar bathrobe		Hooded bathrobe	
	Unit quantities (unit fabric utilization), cm	Efficiency, %	Unit quantities (unit fabric utilization), cm	Efficiency, %	Unit quantities (unit fabric utilization), cm	Efficiency, %
150	231	86.40	230	87.30	250	87.80
151	226	87.70	237	87.50	249	87.40
152	223	88.60	235	87.90	247	87.70
153	222	88.10	234	87.60	244	88.40
154	221	87.30	233	87.50	243	88.20
155	222	87.60	231	87.80	242	87.90
156	219	86.80	229	87.70	237	88.80
157	215	86.80	228	87.60	236	88.70
158	213	87.80	227	87.50	234	89.00
159	212	88.40	224	88.20	233	88.90
160	211	87.90	223	87.10	232	88.50
161	210	87.80	222	87.90	231	88.10
162	209	87.40	220	87.60	230	88.30
163	208	87.30	219	88.50	228	88.80
164	207	87.50	217	87.80	227	87.90
165	206	87.70	215	88.30	226	88.30
166	204	87.10	214	87.30	225	88.20
167	203	88.30	213	87.90	224	88.30
168	202	87.90	212	87.80	222	88.40
169	201	87.90	211	87.50	220	88.50
170	200	87.60	210	87.90	219	88.70

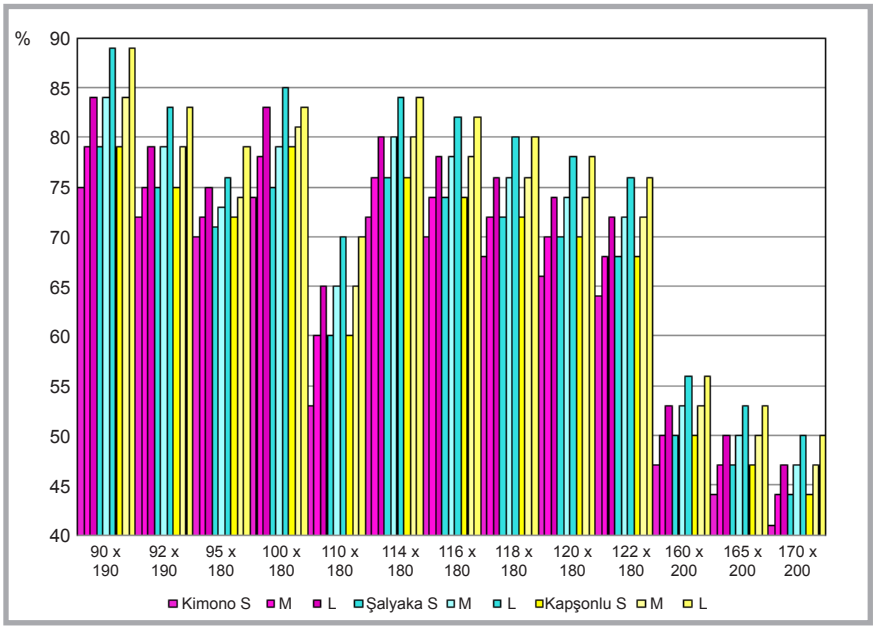

Figure 7. *Fabric utilisation efficiency (%) for pestemal bathrobes with respect to different pestemal sizes.*

According to ***Table 2***, there are different original pestemal dimensions relevant for kimono, shawl collar and hooded bathrobe models. Thus the greater the bathrobe size, the larger the pestemal utilisation rate is. Therefore the efficiency of pestemal increases. Pestemal dimensions of 90 x 190 cm, 92 x 190 cm, 100 x 180 cm and 114 x 180 cm were the ones exhibiting highest efficiency among the three models in comparison with other dimensions. Appropriate pestemal dimensions for the pestemal hooded bathrobe were 110 x 180 cm, 100 x 180 cm and 114 x 180 cm. When 90 x 190 cm pestemal was used for the bathrobe, fabric utilisation efficiencies for S, M and L sizes were estimated at 84%, 79% and 75%, respectively. When considering that efficiency rates obtained with different sizes of terry towel fabric bathrobes were 86% and above, it could be clearly seen that fabric the utilisation

Table 2. *Efficiency of pestemal bathrobe and unit quantities.*

Pestemal dimensions	Kimono bathrobe						Shawl-collar bathrobe						Hooded bathrobe					
	Unit quantities (unit fabric utilization), cm			Efficiency, %			Unit quantities (unit fabric utilization), cm			Efficiency, %			Unit quantities (unit fabric utilization), cm			Efficiency, %		
	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L
80 x 160	320			85			320			88			320			88		
80 x 168	336			80			336			85			336			85		
80 x 170	340			78			340			80			340			80		
85 x 168	336			77			336			79			336			79		
88 x 170	340			76			340			77			340			77		
90 x 190	380	380	380	75	79	84	380	380	380	79	84	89	380	380	380	79	84	89
92 x 190	380	380	380	72	75	79	380	380	380	75	79	83	380	380	380	75	79	83
95 x 180	360	360	360	70	72	75	360	360	360	71	73	76	360	360	360	72	74	79
96 x 160	320			83			360	360	360	72	75	78	360	360	360	72	75	78
98 x 170	340			80			320			83			320			83		
100 x 170	340			75			340			77			340			77		
100 x 180	360	360	360	74	78	83	360	360	360	75	79	85	360	360	360	79	81	83
102 x 175	350	350		70	75		350	350		75	80		350	350		75	80	
104 x 170	340			72			340			75			340			75		
106 x 170	340			70			340			72			340			72		
108 x 170	340			68			340			71			340			71		
110 x 180	360	360	360	53	60	65	360	360	360	60	65	70	360	360	360	60	65	70
112 x 175	350	350		51	57		350	350		57	60		350	350		57	60	
114*180	360	360	360	72	76	80	360	360	360	76	80	84	360	360	360	76	80	84
116 x 180	360	360	360	70	74	78	360	360	360	74	78	82	360	360	360	74	78	82
118 x 180	360	360	360	68	72	76	360	360	360	72	76	80	360	360	360	72	76	80
120 x 180	360	360	360	66	70	74	360	360	360	70	74	78	360	360	360	70	74	78
122 x 180	360	360	360	64	68	72	360	360	360	68	72	76	360	360	360	68	72	76
125 x 160	320			68			320			72			320			72		
130 x 160	320			65			320			70			320			70		
135 x 160	320			62			320			68			320			68		
140 x 160	320			59			320			66			320			66		
145 x 160	320			56			320			64			320			64		
150 x 155	310			53			310			58			310			58		
156 x 156	312			50			312			55			312			55		
160 x 200	400	400	400	47	50	53	400	400	400	50	53	56	400	400	400	50	53	56
165 x 200	400	400	400	44	47	50	400	400	400	47	50	53	400	400	400	47	50	53
170 x 200	400	400	400	41	44	47	400	400	400	44	47	50	400	400	400	44	47	50

efficiency values of pestemal bathrobes with the same size characteristics were lower even with the most appropriate pestemal widths.

The graph in ***Figure 7*** exhibits the fabric utilisation efficiencies of pestemal bathrobes when the most appropriate fabric widths were used for each of the three models. Hence in terms of the best efficiency rates obtained from 2 pieces of original pestemals, the most appropriate dimensions allowing S, M and L sizes to be laid out individually were 90 x 190 cm and 100 x 180 cm. As can be seen from the graph, single size layout on fabrics in 160 x 200cm, 165 x 200 cm or 170 x 200 cm dimensions yielded a low efficiency rate, such as 40-43%. Owing to the substantial amount of fabric wastage, the utility of these given dimensions in bathrobe manufacturing was not found appropriate.

Alternative marker plan for pestemals

In textile facilities in the Denizli territory, pestemales are not woven in fabric rolls, which yield non-discrete manufacturing because of the tufts positioned on hemlines and sleeve hems. The fabric utilisation efficiency of traditional pestemal, offering numerousadvantages in the bathrobe manufacturing process, was found to be lower by 5 to 10% on average in comparison with those manufactured from terry towel fabric. Therefore in order to enhance fabric utilisation efficiency, alternative pattern layout plans were prepared. As a result of various trial layouts prepared in the CAD system to increase efficiency, it was seen that the most appropriate layout was the one exhibited in ***Figure 8***, in which di-

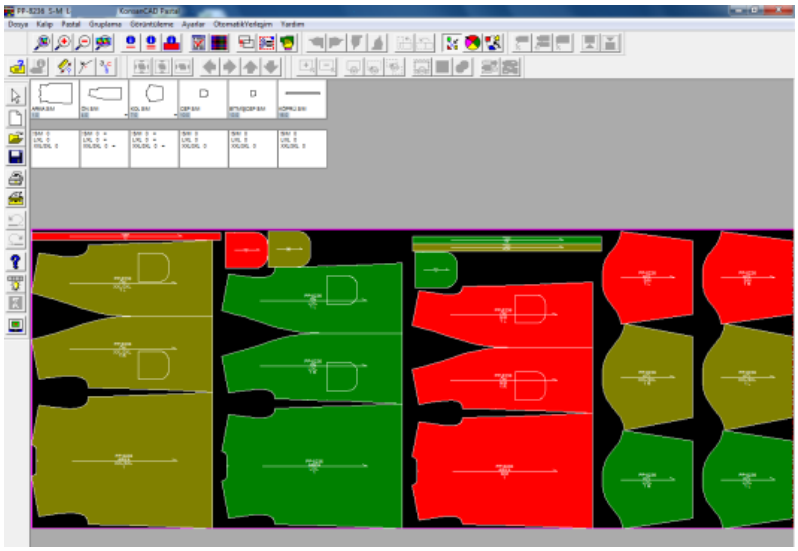

Figure 8. *Pattern layout plan for weaving process with assortment.*

rectional layout and special weaving allowed tufts to be positioned on hemlines, sleeve hems and pocket hems. The 30 to 40 cm gap allowed for the formation of tufts in the special weaving report would allow tuft formation just the same as with original pestemales. Such a layout also enables patterns to be laid out in an assortment. Processing 2 pieces of pestemales spread one on another increases bathrobe manufacturing costs due to increasing labour and fabric wastage.

Table 3 exhibits fabric utilisation efficiency rates and unit quantities for specific pestemal weaving in an assorted distribution form. Due to the specific pattern layout, unit quantities remain constant; and as the fabric width increases, fabric utilisation efficiency decreases. For the shawl collar and hooded bathrobe models, no pattern layout was made for 159 cm and 160 cm widths. Thus a 5 to 8% increase in efficiency was observed with respect to the layout method on the basis of dimensions.

Conslusions

Conventional fabric varieties have been disappearing in parallel with substantial advancements in industry. Accordingly traditional fabrics and clothes are being modernised (e.g. products with jacquard and dyed yard as fashion and design elements are being developed to replace classic pestemal) to utilise them as top clothing etc., and they still prevail in our contemporary times. These products are 500-1000 g lighter than towel bathrobes, absorb water 2-8 sec. faster, and

Table 3. *Fabric utilisation efficiency of bathrobes made with specially woven pestemal, and relevant unit quantities.*

Fabric width, cm	Assortment	Pestemal kimono bathrobe		Pestemal shawl collar bathrobe		Pestemal hooded bathrobe	
		Unit quantities (unit fabric utilization), cm	Efficiency, %	Unit quantities (unit fabric utilization), cm	Efficiency, %	Unit quantities (unit fabric utilization), cm	Efficiency, %
159	S-1,M-1,L-1	192	82.4				
160	S-1,M-1,L-1	192	81.7				
161	S-1,M-1,L-1	192	81.0	203	78.6	209	78.7
162	S-1,M-1,L-1	192	80.6	203	77.2	209	77.3
163	S-1,M-1,L-1	192	79.3	203	76.4	209	76.5
164	S-1,M-1,L-1	192	78.8	203	75.5	209	76.1
165	S-1,M-1,L-1	192	78.2	203	74.3	209	75.6
166	S-1,M-1,L-1	192	77.3	203	72.2	209	75.0
167	S-1,M-1,L-1	192	76.4	203	71.8	209	74.5
168	S-1,M-1,L-1	192	75.5	203	71.3	209	73.8
169	S-1,M-1,L-1	192	73.4	203	70.7	209	73.2
170	S-1,M-1,L-1	192	71.7	203	70.3	209	71.8

they dry faster as well. Since pestemal is lighter, users do not feel extra weight when they wear products made with them. Additionally these fabrics maintain their characteristics and quality after long-term usage. Furthermore they are preferred because of their natural texture, as they do not contain chemical substances.

Moreover, when the environmental impacts of a bathrobe made with terry towel fabric containing natural cotton fibre throughout its economic life are considered, it is realised that they are not as environmentally friendly as they are believed to be. For example, in order to manufacture a bathrobe of 1.5 kg weight, 6 kg cotton needs to be harvested from land, which is processed on special weaving machines, incurring numerous operations. The whole manufacturing process of a terry towel fabric bathrobe requires 150 L of water and a substantial amount of chemical substances. The findings of the study present that cotton fibre, which is the most commonly consumed natural fibre, is not so environmentally friendly a fibre as expected [15]. When it is considered that a pestemal bathrobe weights about 0.4 kg, it can be foreseen that there will be less water and chemical substance needed in its manufacturing process. In our current times in which environmental and public health have gained prominence, the bathrobe and similar products have become especially important.

Environmentally-friendly products can be manufactured that incur savings in terms of energy, raw-material and labour, as well as reduce chemical wastes with an adverse environmental impact. From cloth comfort point of view, pestemals do not disappoint customers as they have a shorter drying period and are light weight. Traditional fabrics which have survived numerous centuries through various fashion and design factors could maintain their popularity and relevance and contribute to regional cultures. However, pestemal-style products inherited through Turkish traditions and customs are required to be woven more efficiently and perfectly by blending today's technology.

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